

16. (Amended) The vacuum heat insulator of claim 13, wherein said plastic film comprises at least one of polycarbonate and polyimide.

### REMARKS

#### **I. Introduction**

In response to the pending rejection, Applicants have cancelled claims 5, 6, 17 and 18, and amended claims 1-4 and 13-16 to address the rejection of the same under 35 U.S.C. § 112, second paragraph. No new matter has been added. It is noted that the amendments to the foregoing claims are not intended to further limit the scope of the claims, but to only clarify the subject matter of the claims in order to overcome the § 112 rejection.

For the reasons set forth below, Applicants respectfully submit that the pending claims are patentable over the cited prior art references.

#### **II. Applicants Respectfully Submit That The Rejection Of Claims 1-6 and 15-18 Under 35 U.S.C. § 112 Is Overcome By Applicants' Amendment To The Same**

Claims 1-6 and 15-18 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

In response to the current rejection, Applicants have cancelled claims 5, 6, 17 and 18, and have amended claims 1-4 and 13-16 so as to address each of the alleged indefinite terms, which are identified in paragraphs 2 and 3 of the Office Action. It is respectfully submitted that, as amended, each of the foregoing claims is definite and readily understandable by one of skill in the art, when read in light of the specification. Accordingly, it is respectfully submitted that the claims, as amended, fully comply with the requirements of 35 U.S.C. § 112, second paragraph. As such, Applicants respectfully submit that the pending rejection under 35 U.S.C. § 112, ¶ 2 has been overcome.

**III. Rejection Of Claims 1-3 And 13-15 Under 35 U.S.C. § 102**

Claims 1-3 and 13-15 were rejected under 35 U.S.C. § 102 as being anticipated by USP No. 5,866,228 to Awata. Applicants respectfully submit that the claims are patentable over Awata for at least the following reasons.

Each of claims 1, 2 and 13, the pending independent claims, relate to a vacuum heat insulator having an insulating core disposed inside of a laminate bag. The laminate bag comprises in-part a support layer comprising a plastic film, which has a glass transition point of 87°C or higher, and a deposition layer formed on the support layer. Importantly, as explained for example on page 16, by utilizing a support layer having the recited glass transition point, when utilized at higher temperatures, the

degree of thermal expansion or shrinkage of the support layer is very small, thereby preventing the cracking of the deposition layer.

Turning to the cited prior art reference and the pending rejection, Awata discloses an insulator having a calcium silicate core 1, a first plastic film 2 comprising polyethylene terephthalate, a metal film 3 comprising aluminum foil, and a second plastic film 4 comprising polypropylene. In the pending rejection it is asserted that the first plastic film 2 comprising polyethylene terephthalate of Awata corresponds to the claimed support layer having a glass transition temperature of 87°C or more. However, as set forth in the enclosure (which is printout from the website [polymerprocessing.com](http://polymerprocessing.com)), the glass transition temperature of polyethylene terephthalate is 76°C. Thus, at a minimum, it is clear that the first plastic layer of Awata does not correspond to the claimed support layer, and cannot be relied upon as doing so.

Accordingly, as anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, ***Kalman v. Kimberly-Clark Corp.***, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983), for the foregoing reasons, it is clear that Awata does not anticipate claim 1, 2 or 13, or any claim dependent thereon.

It is further noted that while claim 1 recites one of four features of the laminate film, the feature disclosed above regarding the glass transition temperature was the featured asserted in the Office Action to be disclosed by Awata. As Awata does not

disclose this feature, it is submitted that claim 1 is patentable over Awata. Moreover, it is noted that Awata does not disclose the use of the protective layer and seal layer, which are recited by claim 1. As shown in Fig. 1 of Awata, the reference only discloses the use of a single film being disposed over the metal layer 3. As such, Awata also fails to anticipate claim 1 for this additional reason.

**IV. All Dependent Claims Are Allowable Because The Independent Claims From Which They Depend Are Allowable**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, ***Hartness International Inc. v. Simplimatic Engineering Co.***, 819 F.2d at 1100, 1108 (Fed. Cir. 1987).

Accordingly, as claims 1, 2 and 13 are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also in condition for allowance. In addition, it is submitted that each of the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

For example, the Examiner has rejected claims 4 and 16 under 35 U.S.C. § 103 over Awata in view of Cheng et al. ('015). This rejection is respectfully traversed for the following reasons. The Examiner admits that Awata does not disclose a film comprising

polycarbonate. The Examiner therefore relies on Cheng et al. for disclosing polycarbonate as an equivalent to the material used in Awata, and thereby modifies Awata by replacing the material thereof with the polycarbonate disclosed by Cheng et al.. The Examiner's asserted motivation is "to make an insulator which is readily molded or shaped." However, Cheng et al. appears to list both polyethylene terephthalate and polycarbonate as being "readily moldable or shapable" with no apparent differentiation therebetween. In fact, as asserted by the Examiner himself, Cheng et al. appears to merely suggest that the two are equivalent for their disclosed purpose. Accordingly, it is respectfully submitted that Cheng et al. does not provide any motivation or rationale for replacing the alleged polyethylene terephthalate of Awata with polycarbonate because there is no disclosed need or desire (i.e., no advantages) for making such a modification.

The only motivation for making the combination is derived from Applicants' specification. That is, the proposed combination is improperly based solely on improper hindsight reasoning, whereby the Examiner selected bits and pieces of the prior art and used only Applicants' specification as a guide to reconstruct the claimed invention. As described throughout Applicants' specification, one of the advantages/ benefits of the present invention is related to using a plastic film having a glass transition point of 87°C or higher. As discussed above, Cheng et al. appears to be completely silent as to using polycarbonate over polyethylene terephthalate for any desired effects. Moreover,

Cheng et al. is directed to using such materials only for solidly molding end portions, so as to raise further questions as to its relevance to a laminated film upon which a metal layer is formed.

In sum, it is submitted that the proposed combination is improper because the Examiner has not provided the requisite **objective** evidence **from the prior art** that "suggests the desirability" of the proposed combination. As is well known in patent law, a *prima facie* showing of obviousness can only be established if the prior art "suggests the desirability" of the proposed combination using **objective** evidence. The Examiner is directed to MPEP § 2143.01 under the subsection entitled "Fact that References Can Be Combined or Modified is Not Sufficient to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. (*In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990)).

In the instant case, even assuming *arguendo* that Awata can be modified by Cheng et al., it is submitted that the "mere fact that [Awata and Cheng et al.] can be combined ... does not render the resultant combination obvious" because nowhere does the **prior art** "suggest the desirability of the combination" as set forth by the Examiner. In contrast, Cheng et al. is completely silent as to any benefits of using polycarbonate in place of the alleged polyethylene terephthalate used in Awata. As mentioned above,

Cheng et al. does not appear to differentiate between polycarbonate and the polyethylene terephthalate. Only Applicants' specification provides the requisite motivation for using polycarbonate in the claimed combination. Accordingly, it is submitted that the cited prior art does not provide any motivation or rationale as to why one would want to use polycarbonate rather than polyethylene terephthalate.

The Examiner is further directed to MPEP § 2143.01 under the subsection entitled "Fact that the Claimed Invention is Within the Capabilities of One of Ordinary Skill in the Art is Not Sufficient by Itself to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

A statement that modifications of the prior art to meet the claimed invention would have been [obvious] because the references relied upon teach that all aspects of the claimed invention were **individually** known in the art is **not** sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. (citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)).

In the instant case, even assuming *arguendo* that Awata and Cheng et al. "teach that all aspects of the claimed invention [are] individually known in the art", it is submitted that such a conclusion "is not sufficient to establish a *prima facie* case of obviousness" because there is no **objective** reason on the record to combine the teachings of the cited prior art. In contrast, Awata and Cheng et al. are completely silent as to suggesting the **combination** of using polycarbonate in the claimed insulator.

At best, the Examiner has attempted to show only that the elements (i.e.,

polycarbonate, etc.) of the claimed invention are ***individually*** known without providing a *prima facie* showing of obviousness that the ***combination*** of elements recited in the claims is known or suggested in the art. For all the foregoing reasons, it is submitted that the proposed combination of Cheng et al. and Awata is improper.

Based on all the foregoing, it is respectfully requested that the rejection of claims 4 and 16 under 35 U.S.C. § 103 over Awata in view of Cheng et al., be withdrawn.

**V. Request For Notice Of Allowance**

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an




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Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Respectfully submitted,

McDERMOTT, WILL & EMERY

Date: 2/20/03

By:  #46,692  
for Michael E. Fogarty  
Registration No. 36,139

600 13th Street, N.W. , Suite 1200  
Washington, D.C. 20005-3096  
Telephone: 202-756-8000  
Facsimile: 202-756-8087

WDC99 699495-1.043890.0430



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

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**IN THE SPECIFICATION:**

*Paragraphs beginning at page 15, line 14 has been amended as follows:*

The operation of the embodiment is explained. The vacuum heat insulator of the embodiment is used as a heat insulator for heating cooker or heating-hot insulating device. The vacuum heat insulator of the invention has a vacuum layer of about 10 mm in thickness by the [actin] acting as the core of the insulating core [107] 105. This vacuum heat insulator has a thermal conductivity of about 0.006 kcal/mh°C (about 0.007 W/m-K). In this composition, the molecules of air transmitting heat from the high temperature side to the low temperature side is extremely small. As the insulating core 105, silica powder is used. The silica powder has a thermal conductivity of about 10 W/m-K at 25°C and atmospheric pressure 760 Torr (mmHg). Therefore, the thermal conductivity at atmospheric pressure is smaller than that of glass fiber. Hence, if the degree of vacuum drops in the laminate bag, the degree of decline of insulating performance is small. Therefore, the heat insulation is maintained for a long period. As a result, the vacuum heat insulator can be used for a long period.

In the conventional vacuum heat insulator using polyethylene terephthalate or other plastic film, when the vacuum heat insulator is used at temperature of about 85°C, the support layer [105] 103 supporting the deposition layer 102 expands or shrinks

thermally. As a result, due to difference in coefficient of thermal expansion between the support layer [105] 103 and deposition layer 102, [crack is] cracks are formed in the deposition material forming the deposition layer 102. In the embodiment, by contrast, as the support layer 103 for supporting the deposition layer 102, polyphenylene sulfide with glass transition point of 87°C, or the polyethylene naphthalate with glass transition point of 121°C is used. Accordingly, when used at high temperature of about 85°C, the degree of thermal expansion or shrinkage of the support layer 103 is very small. Therefore, cracking of the deposition layer 102 is prevented. As a result, the deposition material forming the deposition layer [2] 102 maintains the role of preventing change of degree of vacuum as the barrier layer. Hence, the vacuum heat insulator of the embodiment can maintain the excellent heat insulating performance for a long period as a heat insulator of the device having high temperature.

In the foregoing explanation, as the support layer [105] 103, polyphenylene sulfide or polyethylene naphthalate is used, but other plastic resins as listed in Table 1 may be also used.

#### **IN THE CLAIMS:**

Claims 5, 6, 17 and 18 have been cancelled.

Claims 1-4, 13, 14, 15 and 16 have been amended as follows:

1. (Amended) A vacuum heat insulator comprising:

a laminate bag, and an insulating core [placed] disposed in said laminate bag,  
[wherein an] said inside of said laminate bag [is] evacuated to vacuum,  
said laminate bag [is made of] comprising a laminate film,  
said laminate film [includes] comprising a support layer, a deposition layer  
[evaporated] formed on [the] a surface of the support layer, a protective layer [placed at  
the] formed on a surface [side] of the deposition layer, and a seal layer [placed at the  
back side of the deposition layer],

said deposition layer is formed of at least one material of metal and metal oxide,  
and

said laminate film [has] comprising at least one feature selected from the group  
consisting of:

(i) said support layer [has] comprising a plastic film having a glass transition  
point of 87°C or higher,

(ii) said protective layer [has] comprising a plastic film having a glass  
transition point of 87°C or higher,

(iii) said deposition layer [has] comprising a property of transmitting a high  
frequency magnetic field, and

(iv) said laminate bag [has] comprising a seal portion formed by junction of  
the seal layer[,] and the laminate film [further as a metal foil placed at a position  
excluding the seal portion].

2. (Amended) A vacuum heat insulator comprising:  
a laminate bag, and an insulating core [placed] disposed in said laminate bag,  
[wherein an] said inside of said laminate bag [is] evacuated to vacuum,  
said laminate bag [is made of] comprising a laminate film, and  
said laminate film [includes] comprising a support layer and a deposition layer  
[evaporating] comprising at least one of metal and metal oxide, said deposition film  
disposed on said support film [and]  
said support layer [has] comprising a plastic film having a glass transition point of  
87°C or higher.

3. (Amended) The vacuum heat insulator of claim 2, wherein said plastic  
film [includes] comprises at least one of polyethylene terephthalate and polyphenylene  
sulfide.

4. (Amended) The vacuum heat insulator of claim 2, wherein said plastic  
film [includes] comprises at least one of polycarbonate and polyimide.

13. (Amended) A vacuum heat insulator comprising:  
a laminate bag, and an insulating core [placed] disposed in said laminate bag,

[wherein an] said inside of said laminate bag [is] evacuated to vacuum,  
said laminate bag [is made of] comprising a laminate film,  
said laminate film [includes] comprising a support layer, a deposition layer  
[evaporating] comprising at least one of metal and metal oxide, said deposition film  
formed on said support film and a protective layer disposed [at the surface side of] on  
said deposition layer, and  
said protective layer [has] comprising a plastic film having a glass transition point  
of 87°C or higher.

14. (Amended) The vacuum heat insulator of claim 13, wherein said support  
layer [has] comprises a plastic film having a glass transition point of 87°C or higher.

15. (Amended) The vacuum heat insulator of claim 13, wherein said plastic  
film [includes] comprises at least one of polyethylene terephthalate and polyphenylene  
sulfide.

16. (Amended) The vacuum heat insulator of claim 13, wherein said plastic  
film [includes] comprises at least one of polycarbonate and polyimide.